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long, 1 mm. broad, margins plain, entire; costa strong, 100μ thick at base, vanishing far above the middle, areolation lax, cells 60–80μ long, 12μ broad, walls thin and soft. Other characters unknown. Plate XXV.

Missouri. Monteer, in spring (B. F. Bush, 1899).

The leaves shorter acuminate, the longer and thicker costa and chiefly the loose areolation, at first sight distingnishes this moss from *A. riparium*. The last character also separates it from *A. vacillans* Sulliv. From *A. Kochii* Br. Eur. it differs by its larger leaves and its much stronger and longer nerve.

HYPNUM MALACOCLADUM Card. & Thér.

Monoicous, fine, soft, rather lax, yellowish-green. Stems filiform, prostrate, denuded; branches ascending, about 1 cm. long. Leaves quite distant, soft, concave, spreading, 0.8–1.1 mm. long, 0.4–0.5 mm. broad, strongly narrowed from an ovate base or oblong, very broadly or shortly acuminate, apex rounded or subacute, margins plane, entire, costa thin, simple, extending to the middle or beyond, sometimes subfurcate above, 35–40μ thick at base; alar cells rectangular or subhexagonal hyaline, but not forming distinct auricles; median cells shorter rhomboidal, with thicker walls. Perichaetial leaves erect, longer acuminate, costate; capsule horizontal or obliquely erect, short, gibbous, 1–1.5 mm. long, 0.7 mm. thick: operculum convex-apiculate, Seta short, rather thick, reddish, 8-10 mm. long. Annulus simple, distinct. Peristome 0.4 mm. long, segments of the inner peristome narrowly gaping at the keel, slightly papillose above; cilia 1-2. Spores 12μ in diameter. Plate XXV.

North America: Without locality or name of collector, in herb. L. Debat.

This species somewhat resembles *H. Goulardi* Sch., from which it differs by its longer leaves with a single long costa. It is also distinguished from *H. Closteri* Aust. (*Amblystegium Holzingeri* Ren. & Card.) by its greater size and longer costa.

THE END.

BOOK REVIEWS.

ORGANOGRAPHY OF PLANTS, especially of the Archegoniatae and Spermophyta, by Dr. K. Goebel, Professor in the University of Munich. Authorized English Edition by Isaac Bayley Balfour, Professor of Botany in the University of Edinburgh. Published at The Clarendon Press, Oxford.

The first volume of the English translation appeared in 1900. Part II was issued last summer. A brief synopsis of the references to the *Bryophyta*, in both volumes, may be of interest and stimulate to further study of the living plants.

New Formation of Organs in Regeneration: "In mosses the propagative capacity is uncommonly great; one may almost say that nearly every cell of the vegetative body in mosses and liverworts, and in fact also the cells of the sporogonium which is generally still capable of development, can give rise to a new plant. In the regeneration of the mosses a new plant is not produced directly, but a *protonema* is first formed from which the plant arises, in the same way as the juvenile stage of the plant is developed from the germination of the spore." This is contrasted with the liverworts and suggestions are made for further experiment. A few instances of phenomena of propagation in Bryophyta are cited, such as Marchantia. Dorsiventral organs are described and orthotropous and plagiotropous positions are illustrated by *Hylocomium splendens* and *Mnium undulatum*. Anisophylly, or the differences in size between upper and lower leaves is illustrated by *Cyathophorum pennatum* and reference is made to Rhacopilum and Hypopterygium. Several hepatics are also cited.

Juvenile froms and stages of development are illustrated in *Lejeunia Metzgeriopsis*, *Ephemerum serratum* and *Funaria hygrometrica*, and a cushion of protonema of a species of Bryum in Fig. 90 is a remarkable instance of an unusually large development of this stage of growth.

Investigations on the directive influence of light in the polar differentiation of the spores of many Bryophyta and its influence in the formation of roots are still wanting. The question of the influence of light on the position of the capsules in mosses still requires experimental investigation. Differences are cited between *Sphagnum*, *Orthotrichum* and *Grimmia* and *Buxbaumia* and *Diphyscium*, *Barbula*, *Catharinea* and *Bryum*.

The first section of the second volume deals with the sexual organs of the Bryophyta with illustrations from *Marchantia polymorpha*, *Phascum cuspidatum*, *Funaria hygrometrica*, *Catharinea undulata*, *Monoclea dilatata*, *Sphaerocarpus*, *Blyttia*, *Jungermannia*, and *Mnium undulatum*.

The vegetative organs of the Hepaticae, the asexual propagation, the phenomena of adaptation in order to retain water and resist drought are described and figured in detail as well as the protection of their sexual organs and the types of sporogonia and their development, and the germination of the spores.

The life history of various mosses is described from the germination of the spore, the development of the protonema, the formation of roots, stems and leaves, their special forms and functions, their arrangements for retaining water, and resisting drought: their relation to light, the development of the sexual organs: the structure of the sporogonium and its various types and adaptations for shedding the spores.

A few quotations will suffice to show how suggestive of further study and experiment these chapters on the Bryophyta are: "There is wanting in the musci the wealth of adaptation in the form of the leaf in relation to the retention of water that is so manifest in the Hepaticae: the complex auricles are absent. Outgrowths of their surface, such as mamillae or papillae, occur in species growing in dry sunny places, such as *Hedwigia ciliata*, but not on hygrophilous species, and would probably disappear if cultivated in moisture and shade. The method of sponge construction by means of empty cells with perforated walls, is well shown in *Sphagnum* and *Leucobryum*; one is fitted to evaporate water rapidly, the other to retain it."

A list of the illustrations would be too lengthy as there are ninety-seven of the Hepaticae and thirty-three of the mosses.

The connection between the Bryophyta and the Pteridophyta is discussed, although positive results have not been reached.

This book promises to be very stimulating to the student of mosses and hepatics as living organisms, and will encourage further study along the lines so clearly indicated.

Elizabeth G. Britton,
N. Y. Botanical Gardens.

The Fern Allies of North America, north of Mexico, by Willard N. Clute. With more than one hundred and fifty illustrations and eight colored plates, by Ida M. Clute. Published by Frederick A. Stokes Co., New York City, at $2.00.

This is a companion volume to the author's "Our Ferns in Their Haunts," and describes in technical language the scouring-rushes, horsetails, running-pines, club-mosses, water-ferns, pillworts, water-peppers, quillworts and the various other plants included among the Fern Allies. The illustrations are most helpful, especially the black and white cuts. The claim is made that here *all* our species are illustrated and many for the first time. The book also contains a check-list of the North American species with synonomy, a complete glossary, and seven keys to the genera and species based on the most noticeable characters. In the matter of nomenclature our author claims to have adapted a somewhat conservative treatment, using for the most part the names common in other works of this class. This notice is intended merely to call the attention of our readers to a good book to add to their equipment for next season's outdoor work and not as a critical analysis. The book is well made up, though the printing as to type is not all one could desire. The black and white drawings are clear and characteristic of the species treated. The colored plates in our opinion add nothing to the value of the illustrations.

A. M. S.

SULLIVANT MOSS CHAPTER NOTES.

The list of members elsewhere printed numbers one hundred fifty-six. Four have qualified for membership during December making our total one hundred and sixty on January 1, 1906: Prof. E. E. Bogue, Agricultural College P. O., Michigan. Prof. John Macoun, Sussex street, Ottawa, Canada. Mr. R. S. Gray, 508 Montgomery street, San Francisco, Calif. Mrs. Ella L. Horr, Wor. Nat. Hist. Soc., 12 State St., Worcester, Mass.

CHAPTER NOTE.

In connection with the admission to membership in the Sullivant Moss Chapter of persons who are not resident in the United States or Canada, the question has arisen as to how they may participate most easily in the offerings published in each issue of the Bryologist. In view of the fact that foreign letter postage is more than double that of domestic, it seems unfair to impose upon our foreign friends the added cost of transportation. Hence the following scheme is put forward: